

REMARKS

By the foregoing amendments, Claim 10 has been canceled, new Claims 27 and 28 have been added and Claims 1, 11, 12 and 14 have been amended. Thus, the claims presently pending are Claims 1-9, 11-19, 27 and 28. These changes are believed not to introduce new matter, and their entry is respectfully requested.

Applicant will address each rejection in the June 4, 2003 Office Action separately below, categorized for the ease of the Examiner.

A. Rejections Under 35 U.S.C. 102

1. Rejection Using Yokota et al. Reference

Claims 1-6 and 14-16 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yokota et al. (UK Patent Application No. 2,166,289).

With respect to independent Claim 1, Applicant respectfully submits that Yokota et al. does not teach (expressly or inherently) at least the following feature recited in amended Claim 1: *“a second two-color photo-detector having a third photo-detector element in an elevated relation with a fourth photo-detector element, said third photo-detector element being electrically isolated from said fourth photo-detector element, said second two-color photo-detector being sensitive to a second total wavelength range different from said first total wavelength range.”*

For at least the foregoing reasons, Applicant respectfully requests that the rejection of Claim 1 be withdrawn. Claims 2-6 are either directly or indirectly dependent upon Claim 1, and therefore, for at least the reasons stated above with respect to Claim 1, Applicant respectfully requests that the rejection of Claims 2-6 be withdrawn.

Regarding independent Claim 14, Applicant respectfully submits that Yokota et al. does not teach (expressly or inherently) at least the following feature present in amended Claim 14: “*a second two-color photo-detector having a third photo-detector element in an elevated relation with a fourth photo-detector element, said second two-color photo-detector being sensitive to a second total wavelength range different from said first total wavelength range.*” Therefore, Applicant respectfully requests that the rejection of Claim 14 be withdrawn. Claims 15 and 16 are directly dependent upon Claim 14, and therefore, for at least the reasons stated above with respect to Claim 14, Applicant respectfully requests that the rejection of Claims 15 and 16 be withdrawn.

2. Rejection Using Bioss, III et al. Reference

Claims 1-3, 9, 14, 15 and 19 stand rejected under 35 U.S.C. 102(b) as being anticipated by Bioss, III et al. (U.S. Pat. No. 4,513,305).

With respect to independent Claim 1, Applicant respectfully submits that Bioss, III et al. also does not teach (expressly or inherently) at least the following feature recited in amended Claim 1: “*a second two-color photo-detector having a third photo-detector element in an elevated relation with a fourth photo-detector element, said third photo-detector element being electrically isolated from said fourth photo-detector element, said second two-color photo-detector being sensitive to a second total wavelength range different from said first total wavelength range.*”

For at least the foregoing reasons, Applicant respectfully requests that the rejection of Claim 1 be withdrawn. Claims 2, 3 and 9 are either directly or indirectly dependent upon Claim 1, and therefore, for at least the reasons stated above with respect to Claim 1, Applicant respectfully requests that the rejection of Claims 2, 3 and 9 be withdrawn.

Regarding independent Claim 14, Applicant respectfully submits that Bioss, III et al. also does not teach (expressly or inherently) at least the following feature present in amended Claim 14: “*a second two-color photo-detector having a third photo-detector element in an elevated relation with a fourth photo-detector element, said second two-color photo-detector being sensitive to a second total wavelength range different from said first total wavelength range.*” Therefore, Applicant respectfully requests that the rejection of Claim 14 be withdrawn. Claims 15 and 19 are directly dependent upon Claim 14, and therefore, for at least the reasons stated above with respect to Claim 14, Applicant respectfully requests that the rejection of Claims 15 and 19 be withdrawn.

3. Rejection Using Nozaki et al. Reference

Claims 1, 7 and 8 stand rejected under 35 U.S.C. 102(b) as being anticipated by Nozaki et al. (U.S. Pat. No. 4,677,289).

With respect to independent Claim 1, Applicant respectfully submits that Nozaki et al. does not teach (expressly or inherently) at least the following features recited in amended Claim 1:

- (1) “*a first two-color photo-detector sensitive to a first total wavelength range, said first two-color photo-detector having a first photo-detector element capable of absorbing light within a first range of wavelengths of said first total wavelength range and a second photo-detector element capable of absorbing light within a second range of wavelengths of said first total wavelength range, said first photo-detector element being in an elevated relation with said second photo-detector element*”; and also

- (2) *“a second two-color photo-detector having a third photo-detector element in an elevated relation with a fourth photo-detector element, said third photo-detector element being electrically isolated from said fourth photo-detector element, said second two-color photo-detector being sensitive to a second total wavelength range different from said first total wavelength range.”*

On Page 5 of the Office Action, the Examiner commented on Nozaki et al., stating: “Regarding Claim 1, Nozaki et al. teach ... said first photo-detector element being electrically isolated from said second photo-detector element (by (44G) and (44R)).” Applicant respectfully disagrees with the Examiner. Layers 44G and 44R of Nozaki et al. are described on col. 8, lines 35-41 as “transparent conductive layers and serve both as connection terminals for series-connecting photodiodes, and also as layers for transmitting the incident light to the underlying photodiodes.” Examples of “transparent conductors” are listed on col. 7, lines 27-29 of Nozaki et al. Such examples include ITO (Indium-Tin-Oxide) and SnO₂ (Tin Oxide). Materials, such as ITO and SnO₂, that serve to electrically series-connect photodiodes cannot be said to provide electrical isolation between layers.

For at least the foregoing reasons, Applicant respectfully requests that the rejection of Claim 1 be withdrawn. Claims 7 and 8 are either directly or indirectly dependent upon Claim 1, and therefore, for at least the reasons stated above with respect to Claim 1, Applicant respectfully requests that the rejection of Claims 7 and 8 be withdrawn.

In addition, with respect to Claims 7 and 8, Applicant respectfully submits that Nozaki et al. does not teach (expressly or inherently): *“a color filter in an elevated relation with said first photo-detector element,”* as recited in Claim 7. On Page 5 of the Office

Action, the Examiner stated “Nozaki et al. teach (see Fig. 4) a color filter (46) in an elevated relation with said first photo-detector element.” Applicant respectfully disagrees. Layer 46 of Nozaki et al. is described on col. 8, lines 39-42 as “an infrared light, cut-filter, which is used to prevent a photocurrent from being produced in the infrared sensitive photodiode.”

An IR filter does not teach the use of “a color filter,” as is claimed in Claim 7. As the Examiner is aware, the term “color” is a property of visible light and is known in the art as referring to the visible light portion of the electromagnetic spectrum, whereas infrared is known in the art as referring to the IR portion of the electromagnetic spectrum. Furthermore, Applicant notes that one of the objects of Nozaki et al. is “to provide a color sensor ... without the need of using various color filters.” Therefore, for these additional reasons as well as the reasons recited above, Applicant respectfully requests the rejection of Claims 7 and 8 be withdrawn.

B. Rejections Under 35 U.S.C. 103

1. Rejection Using Nozaki et al. Reference

Claims 10-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Nozaki et al. With respect to Claims 11-13, Applicant notes that Claims 11-13 are directly or indirectly dependent upon Claim 1, and therefore, for at least the reasons stated above with respect to Claim 1, Applicant requests the rejection of Claims 11-13 be withdrawn. Claim 10 has been canceled, thus rendering the rejection of Claim 10 moot.

In addition, with respect to Claim 11, Applicant respectfully submits that Nozaki et al. does not disclose or suggest “*said first color filter absorbing light within a third range of wavelengths and passing light within said first and second ranges of wavelengths, said*

second two-color photo-detector further comprising a second color filter in an elevated relation with said third photo-detector element of said second two-color filter, said second color filter absorbing light within either said first or second ranges of wavelengths, passing light within said third range of wavelengths and passing light within either said first or second ranges of wavelengths not absorbed by said second color filter,” as recited in Claim

11. On Page 6 of the Office Action, the Examiner stated “It would have been obvious to one of ordinary skill in the art at the time of the invention was made to include a second, third and fourth two-color photo-detector identical to the first two-color photo-detector with a second color filter.” Applicant notes from the above-recited claim language that the second two-color photo-detector is not “identical” to the first two-color photo-detector, as the Examiner stated. Instead, the first two-color photo-detector absorbs light within first and second wavelength ranges, while the second two-color photo-detector absorbs light within a third wavelength range and either the first or second wavelength range.

Furthermore, Applicant notes that one of the objects of Nozaki et al. is as follows: “since respective photodiodes are stacked one over another, it is possible to identify the color components of light incident on a small area, i.e., one kind of photosensing area when viewed in a planar plane.” Therefore, Nozaki et al. does not teach or suggest two photo-detectors, each for absorbing different wavelength ranges. Instead, the purpose of Nozaki et al. is to absorb all wavelength ranges in one photo-detector. Thus, Nozaki et al. teaches away from the presently claimed invention.

Furthermore, with respect to Claims 12 and 13, Applicant respectfully submits that Nozaki et al. does not disclose or suggest “*wherein said third photo-detector element is capable of accumulating charge upon reception of light within a third range of wavelengths and said fourth photo-detector element is capable of accumulating charge upon reception of*

light within a fourth range of wavelengths,” as recited in Claim 12. Applicant notes from the above-recited claim language that the second two-color photo-detector is also not “identical” to the first two-color photo-detector, as the Examiner stated. Instead, the first two-color photo-detector absorbs light within first and second wavelength ranges, while the second two-color photo-detector absorbs light within a third and a fourth wavelength range. Furthermore, Applicant submits that Nozaki et al. teaches away from the presently claimed invention for reasons similar to those discussed above in connection with Claim 11.

2. Rejection Using Yokota et al. and Nozaki et al. References

Claims 17 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Yokota et al. in view of Nozaki et al. Applicant notes that Claims 17 and 18 are directly or indirectly dependent upon Claim 14, and therefore, for at least the reasons stated above with respect to Claim 14, Applicant requests the rejection of Claims 17 and 18 be withdrawn.

In addition, Applicant respectfully submits that the combination of Yokota et al. and Nozaki et al. does not disclose or suggest: “*a color filter in an elevated relation with said first photo-detector element,*” as recited in Claim 17. On Page 7 of the Office Action, the Examiner stated “Yokota et al. do not teach a color filter ... Nozaki et al. teach ... a color filter (46) in an elevated relation with said first photo-detector element.” Applicant respectfully disagrees. As Applicant pointed out above, layer 46 of Nozaki et al. is described on col. 8, lines 39-42 as “an infrared light, cut-filter, which is used to prevent a photocurrent from being produced in the infrared sensitive photodiode.” An IR filter does not teach the use of “a color filter,” as is claimed in Claim 17. Therefore, for these additional reasons as well as the reasons recited above, Applicant respectfully requests the rejection of Claims 17 and 18 be withdrawn.

CONCLUSION

Thus, all grounds of rejection and/or objection are traversed or accommodated, and favorable reconsideration and allowance are respectfully requested. Should the Examiner have any further questions or comments facilitating allowance, the Examiner is invited to contact Applicant's representative indicated below to further prosecution of this application to allowance and issuance.

Respectfully submitted,

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